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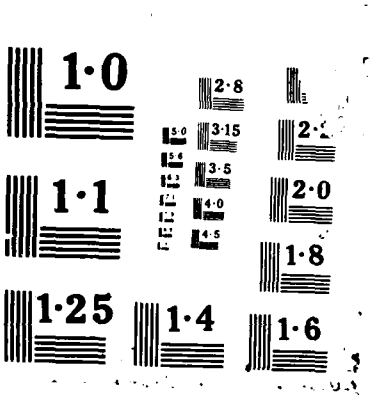
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A new automated technique for sensing translational/rotational mask-to-wafer alignment will be presented that is useful with proximity printing processes such as masked ion beam or x-ray lithography. The technique is based on computer interpretation of fringe patterns created by laser beams diffracted from unique grating structures on both the mask and the wafer. It requires no moving parts and features a simple optical configuration that uses a dielectric cube beamsplitter to recombine the diffracted beams. Being an interferometric technique, precision better than 20 nm is easily achieved, while the novel grating structure and fringe analysis provides a capture range in excess of 20 μm. Additional key features of the technique are that it is insensitive to variations in the gap between mask and wafer and that its performance does not degrade with changes in surface reflectivity or topography as device wafers are processed. A single channel of the grating alignment technqiue has been implemented and tested in a laboratory bench fixture. The required mathematics, computer code, and experimental results will be discussed.

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A practical interferometric technique for mask/wafer alignment during proximity printing

by

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Abstract

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